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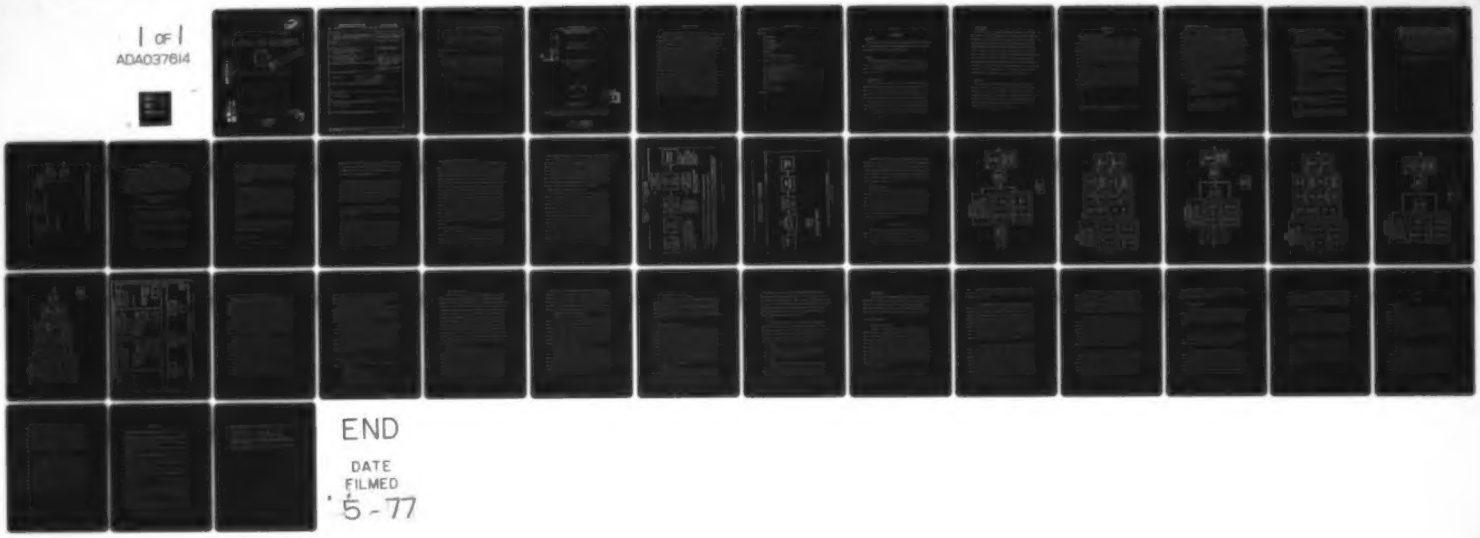

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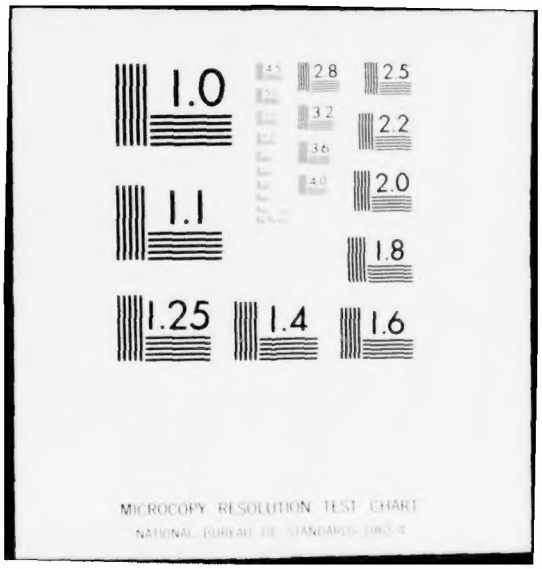
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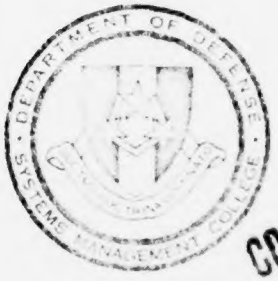

PROGRAM MANAGEMENT COURSE

A STUDY OF THE
SINGLE INTEGRATED DEVELOPMENT TEST CYCLE
POLICY IN DEVELOPMENT TEST AND
EVALUATION OF ARMY MATERIEL

Study Project Report
PMC 76-2

James R. Pritchett
GS-13 DAC

FORT BELVOIR, VIRGINIA 22060

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REPORT DOCUMENTATION PAGE

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DEFENSE SYSTEMS MANAGEMENT COLLEGE

STUDY TITLE:

A Study of the Single Integrated Development Test Cycle (SIDTC) Policy in Development Test and Evaluation of Army Materiel

STUDY PROJECT GOALS:

a. To research and relate the rationale for implementation of the SIDTC policy.
b. To research and relate the roles, responsibilities and interfaces between the major players of SIDTC (Developers, MSC/PM, Contractor, Tester, and Evaluator).
c. To examine the impact of SIDTC on management of DT&E of Army Materiel.

STUDY REPORT ABSTRACT:

The study was undertaken to examine the Single Integrated Development Test Cycle (SIDTC) policy and its operation in Development Test and Evaluation. The new policy in Development Testing of Army Materiel was initiated in January 1975. The study examines the background leading to implementation of the integrated test policy, outlines the roles of major participants in programs utilizing SIDTC, describes the importance of the Test Integration Working Group (TIWG) and Coordinated Test Program (CTP) to succesful functioning of a SIDTC, and examines effects of SIDTC on key participants (developer, development tester, evaluator, and contractor) over a period of approximately 21 months. A general lack of quantified data precludes definitive conclusions as to success or failure of SIDTC; examples of successful utilization in five notable programs are reported.

KEY WORDS: ARMY DEVELOPMENT TEST AND EVALUATION
SINGLE INTEGRATION DEVELOPMENT TEST CYCLE (SIDTC)

NAME, RANK, SERVICE	CLASS	DATE
James H. Pritchett, GS-13, DAC	PMC 76-2	November 1975

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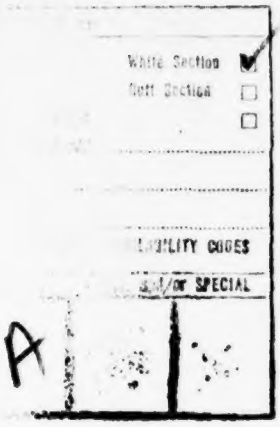
A STUDY OF THE SINGLE INTEGRATED DEVELOPMENT TEST CYCLE POLICY IN DEVELOPMENT TEST AND EVALUATION OF ARMY MATERIEL



Study Project Report

Individual Study Program

Defense Systems Management College

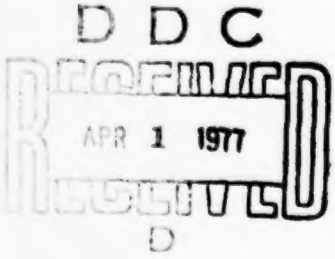
Program Management Course

Class 76-2

by

James R. Pritchett
GS-13 DAC

November 1976



Study Project Advisor
Mr. Larry Birk

This study project report represents the views, conclusions and recommendations of the author and does not necessarily reflect the official opinion of the Defense Systems Management College or the Department of Defense.

EXECUTIVE SUMMARY

The Army's new direction in materiel testing has been in effect since January 1975. The new policy called Single Integrated Development Test Cycle (SIDTC) was implemented to provide a more effective and efficient materiel testing processs. Essentially the objective of the new policy is to reduce cost and schedule by eliminating unnecessary duplicate testing which occurred frequently under the previous test policy. The Single Integrated Development Test Cycle philosophy places increased emphasis on independent evaluation and less emphasis on independent testing. The change in test policy also required significant changes in some of the traditional roles of key Army test participants such as the materiel developer, development tester, and test evaluator. In the Single Integrated Development Test Cycle the role of contractor testing in satisfying Government test requirements is greatly expanded. This study report examines the rationale leading to implementation of the Single Integrated Development Test Cycle policy, the responsibilities of key participants, and how the system is working. The information acquired should be of interest to those involved in management and execution of Army materiel testing.

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SECTION I

INTRODUCTION

1.1 Purpose:

The purpose of this study paper is to acquire a substantial background of knowledge pertaining to the implementation and operation of the Single Integrated Development Test Cycle (SIDTC) policy.

1.2 Scope:

This study paper examines actions leading to initiation of the new policy, its effect on roles and responsibilities of key participants, and relates some experiences of these key participants in the operation of programs under SIDTC.

1.3 Specific Goals:

The SIDTC is a newly implemented Army test policy which significantly redefines the conduct of Development Test and Evaluation (DT&E) of Army materiel. Information on the SIDTC has not appeared in widely circulated media such as periodicals. Consequently, there appears to be a lack of knowledge of the new policy in some areas of the Army test community. Specific goals of this study project were to acquire information to understand and relate the rationale for implementation of the SIDTC policy, to understand and relate changes in roles and responsibilities of major participants, and to examine and describe the effect to date of the SIDTC policy on management and conduct of DT&E of Army materiel.

1.4 Limitations:

The SIDTC policy is a very broad subject with many ramifications. The many players, roles, and responsibilities involved can not be treated individually and in detail within the constraints of this study project. This paper concentrates on major aspects of the development test structure. Operational test is only delt with to show how it relates to the SIDTC. There are numerous players involved in the operation of a program under SIDTC. However, this report is limited to those participants considered to have key roles on the development side, i.e., materiel developer-PM, development tester (TECOM), development evaluator (AMSAA), and contractor. The SIDTC policy applies to major, designated non-major, and other non-major programs. In this report structures and procedures refer to the major and designated non-major program process unless stated otherwise.

1.5 Method:

This report is based on information available at the time of its preparation. Both time and resources were limited. Books and periodicals were not useful sources of information for this particular subject. Sources of input consisted of briefing materiels, internal documents, correspondence between Army commands and activities, Army regulations, and informal interviews and phone conversations with DARCOM and TECOM personnel who provided authoritative information on the subject.

SECTION II

BACKGROUND

2.1 New Concept in Army Testing:

In January 1975 AMC, now Development and Readiness Command (DARCOM), initiated a "new direction"[12*] in Army test philosophy. The new concept, termed Single Integrated Development Test Cycle (SIDTC), through implementation letter dated 21 January 1975 instructed that all new programs would implement the policy at program inception; current contracts and on-going programs would be restructured to implement the new integrated test concept to the maximum extent possible within funding and scheduling constraints.[5]

The new direction in test policy was designed to reduce costs and time through elimination of duplicate testing which previously had been an undesirable characteristic of Army developmental testing and to some extent operational testing as well. To provide some insight into the rationale and need for this new policy some of the history leading up to it will be related.

*Reference sources are identified by superscript throughout this report and are keyed numerically to Bibliography listings.

2.2 Rationale Leading to Change:

In 1972, as a result of findings by a Department of Defense Blue Ribbon panel, a requirement for operational testing to be accomplished by an agency other than the materiel developer was made mandatory by DA. This led to formation of the Operational Test and Evaluation Agency (OTEA) and its sharing of the Operational Testing (OT) responsibility with TRADOC. OTEA assumed OT responsibility for major and selected non-major systems and TRADOC assumed OT responsibility for all other systems.[12] The result was four separate testers: contractor, developer, TECOM, and the operational tester each functioning independently of the others and conducting tests in a sequential manner. Overlapping requirements and duplication of testing was common under these conditions.

In 1974, the findings of other investigative groups contributed to another significant change in Army test philosophy. Their recommendations, basically and in brief, were as follow:

a. Army Materiel Acquisition Review Council (AMARC):

- Transfer TECOM test boards to TRADOC to conduct Operational Tests (OT) and Force Development Test and Experimentation (FDT&E).

- Designate Army Materiel Systems Analysis Agency (AMSAA) as independent evaluator of Development Tests (DT) and developer of the test design.[12]

b. Joint AMC/Industry Atlanta Conference:

- Reduce excessive testing by the Government.
- Reduce duplication of contractor testing during DT by the Government.[12]

c. Research Development Acceptance Test (RDAT) Study:

- Establish policy of single integrated contractor, developer, AMSAA, and TECOM test.
- Structure contracts to assure contractor demonstration of essential contract compliance to obtain confidence for success in any government testing.
- Eliminate term RDAT. Replace with Prototype Qualification Test (PQT).
- Annotate DD Form 250 to indicate hardware is accepted for test purposes only, not contract compliance.
- Require formal review for traceability of required ROC, DP, and System specification prior to proposal solicitation.[20]

d. Revised AR 1000-1, Basic Policies for Systems Acquisition by the Department of the Army, 5 November 1974.

- Establish Single Integrated Development Test Cycle (SIDTC) Policy:

"During the development phase of the acquisition cycle the larger, more sophisticated systems will be subject to only two test cycles. The contractor and materiel developer developmental testing should be integrated into one cycle with operational

testing constituting the other test cycle. For the smaller, less sophisticated systems, sufficient prototype hardware can on occasion be provided that would permit totally independent materiel developer testing. The policy of coordinating test planning with the objective of minimizing the number of tests applies to all systems."[1]

In essence, these findings could have been interpreted thusly:

- An integrated test philosophy to eliminate duplicatory materiel testing would greatly facilitate a more effective and efficient policy in the conduct of army testing.

The Single Integrated Development Test Cycle (SIDTC) was promulgated to accomplish this objective.

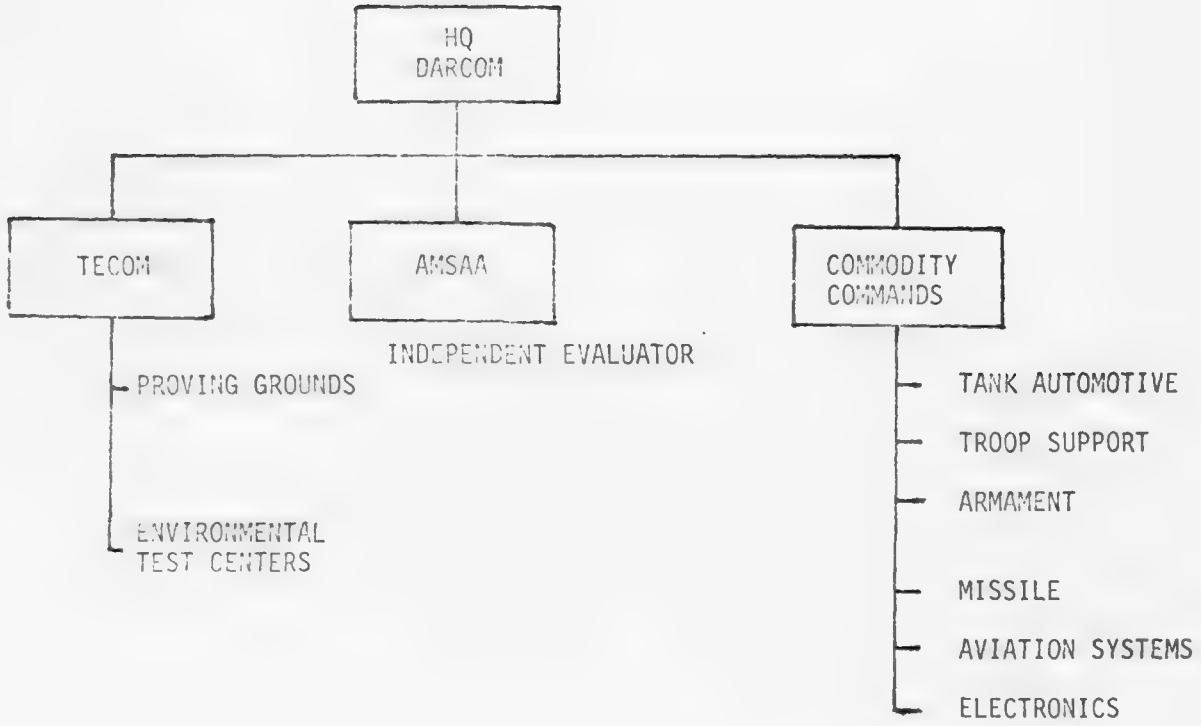


FIGURE 1

DARCOM'S ORGANIZATION FOR TEST AFTER REALIGNMENT OF TEST BOARDS AND IMPLEMENTATION OF THE SINGLE INTEGRATED DEVELOPMENT TEST CYCLE POLICY[19]

SECTION III

OBSERVATIONS AND DISCUSSION

3.1 Responsibilities Under Single Integrated Test Cycle (SIDTC):

Execution of SIDTC required acceptance of new roles and responsibilities by the major players involved. Major players, in this instance, refers to the Developer (MSC/PM), AMSAA, and TECOM. However, the expanded role of the contractor and inclusion of the OT interface should not be diminished. The following responsibilities associated with SIDTC were delineated in DARCOM's Letter of Implementation.

RESPONSIBILITIES OF THE DEVELOPER (MSC/PM)

AMSAA AND TECOM

1. Responsibilities of the Developer (MSC/PM):

   a. Preparation of the Coordinated test Program (CTP) in coordination with the Combat Developer, Operational Tester, Logistician, AMSAA TECOM and with appropriate contractor participation.

   b. Management of the Development Test portion of the Coordinated Test Program (CTP).[5]

2. Responsibilities of AMSAA:

   a. Preparation of the Independent Evaluation Plan for DT I, DT II, and DT III for major, designated nonmajor and other selected systems; also to overview the other systems on a sampling basis.

This plan details actions for acquiring sound test data responsive to the decision process and provides the basis for formulation of the overall test design. The plan is coordinated with the Developer (MSC/PM) and TECOM and is provided as input to the Coordinated Test Program (CTP).

b. Preparation of the overall test design for DT I, DT II, and DT III for major, designated non-major systems and other selected systems. The test design serves as the basis for determining those tests that will be performed by the contractor, AMC major subordinate commands, project managers and TECOM which will be used for the overall system evaluation. The test design is coordinated with the Developer and TECOM, and provided as input to the Coordinated Test Program (CTP).

c. Preparation of the Independent Overall Evaluation of Major and designated non-major systems and other selected systems for presentation to the Developer and CG AMC [DARCOM].[5]

3. Responsibilities of TECOM:

a. For systems which AMSAA is not the evaluator:

(1) Preparation of the Independent Evaluation Plan for DT I, DT II and DT III. This plan details actions for acquiring sound

test data responsive to the decision process and provides the basis for formulation of the overall test design. The plan is developed in coordination with the MSC's materiel proponent and is provided as input to the Coordinated Test Program.

(2) Preparation of the overall test design. The test design serves as a basis for determining those tests that will be performed by the contractor, AMC [DARCOM] major subordinate commands, project managers and TECOM, which will be used for the overall evaluation. The test design is coordinated with the MSC's materiel proponent and provided as input to the Coordinated Test Program.

(3) Preparation of the Independent Overall Evaluation in coordination with the MSC "Red Team" for presentation to the Developer and CG AMC [DARCOM].

b. For all systems, TECOM will plan, conduct and prepare analysis of government validation tests, when required. (Advanced Development Verification Test - Government, Prototype Qualification Test - Government, and Production Validation Test - Government). The MSC's materiel proponent and AMSAA will also conduct their own independent analyses of these test results, as required. TECOM will provide test reports and analysis of test results to the MSC's materiel proponent and AMSAA for system evaluation.[5]

3.2 Test Integration Working Group (TIWG):

Early coordination of test requirements for DT and OT became an integral part of successful execution of the integrated test cycle. To facilitate the integration of test requirements and to speed the coordination process, the materiel developer is required to establish and chair a test Integration Working Group (TIWG) for each major and selected non-major program. The group is formally chartered and consists of reqpresentatives having authority to act for their respective commands or activities. However, they do not have the authority to approve the Development Plan (DP), alter system specifications, or address agenda items not pertinent to or coordinated with principal members. For systems other than major and selected non-major the decision to form or not to form a TIWG is made by a joint materiel developer - combat developer working group. TIWG membership includes as a minimum representatives of the Combat Developer, Logistician, Operational Tester, AMSAA, TECOM and where appropriate, the contractor. Primary purpose of the TIWG is to assist the developer in the preparation of the Coordinated Test Program (CTP), monitor test program progress, and update the CTP when required.[5]

3.3 Coordinated Test Program (CTP):

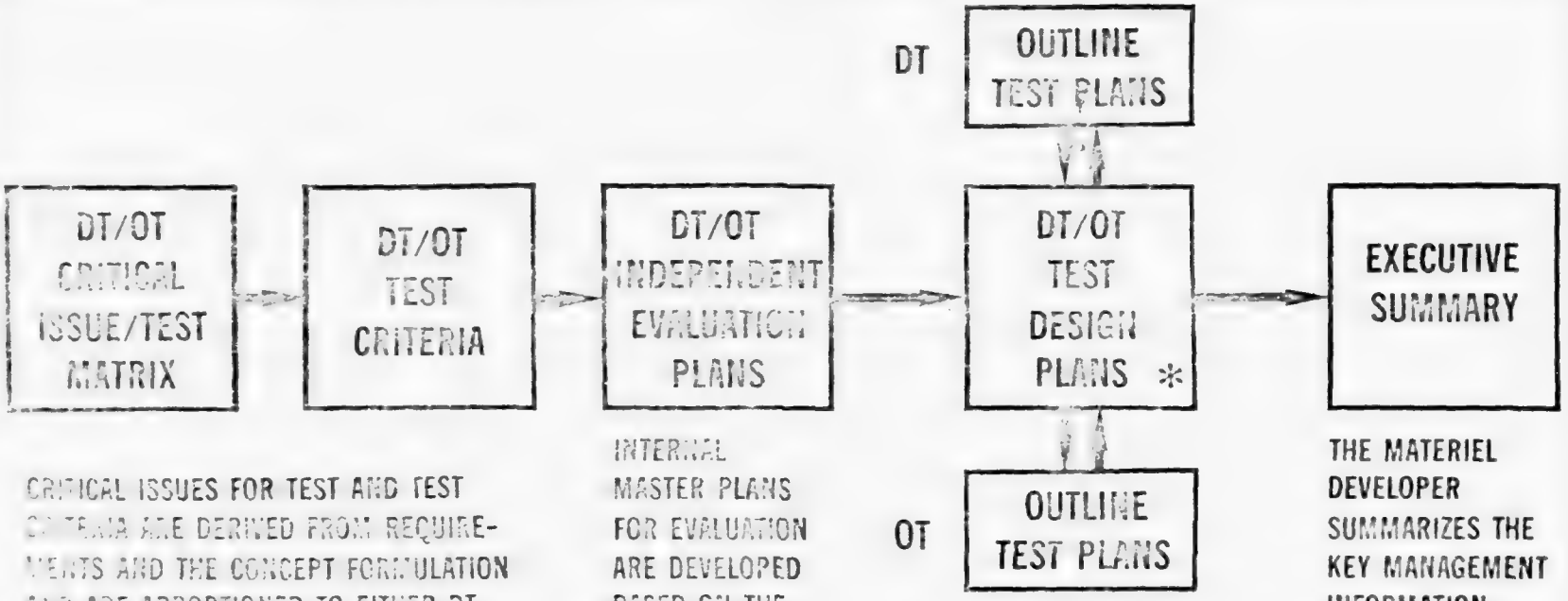
The CTP is the key management document for assuring that all appropriate testing accomplished by the contractor, proponent materiel developer, TECOM, and the operational tester is properly planned, coordinated, conducted, analyzed, and reported. The materiel developer (PSC/PM) is responsible for preparation, coordination, distribution, and updating the CTP. Coordination and concurrences involve all primary members of the TIWG. This

document identifies required testing, test personnel, organizations involved, materiel, facilities, troop support, logistic support, funds, critical issues, and test criteria for implementing the test program. It provides assurance that DT and OT design plans will be coordinated so that each test cycle requires minimum resources and yields maximum data to satisfy the common need of the materiel developer and the operational tester. The CTP is used to plan, coordinate and integrate the scheduling of all DT and OT and any other testing required for an item or system. As such, it provides a complete testing perspective for the program.[4]

3.4 Formulation and Preparation of the CTP:

The Coordinated Test Program is not a new document invented just for SIDTC, it was a part of previous Army test planning concepts. However, the CTP was reformated to complement the new integrated test policy. Actually, the new CTP is not a single document covering all phases of the acquisition cycle as was the case in the past. In SIDTC three separate documents are written. Each document addresses the appropriate testing to be accomplished during the particular phase of the materiel acquisition process for which it applies. There is the CTP-I for Validation phase testing, a CTP-II for Full Scale Development phase testing, and a CTP-III for the Production and Deployment phase. It may not be excessive to describe the CTP and TIWG as being central to the SIDTC operations. The coordination of effort evolving out of TIWG and CTP activities has been described as one of the keystones of the SIDTC. (see paragraph 3.6) It is through the TIWG and CTP formulation and preparation that a major interface with the operational test proponent occurs. Figures 2 and 3[4] show a typical formulation and preparation flow process for development of the CTP.

FORMULATION PROCESS



*CURRENT OT OTP SUBSTITUTES FOR OT TDP UNTIL OT TDP ARE APPROVED FOR DISTRIBUTION

NOTE 1: TDP AND OTP CONSTITUTE CHAPTER 2 OF CTP; THE EXECUTIVE SUMMARY IS CHAPTER 1.

NOTE 2. FOR MAJOR AND CATEGORY I SYSTEMS, THE TWG IS THE PRIMARY VEHICLE FOR COORDINATION OF THE CTP TO INSURE INTEGRATION OF TEST REQUIREMENTS AND ELIMINATION OF ALL UNNECESSARY DUPLICATE TESTING.

FIGURE 2 CTP FORMULATION PROCESS

PREPARATION PROCESS

DSARC
ASARC

IN-PROCESS REVIEW

*SUBJECT TO REVISION DURING PROGRAM EXECUTION

FIGURE 3 CTP PREPARATION PROCESS[4]

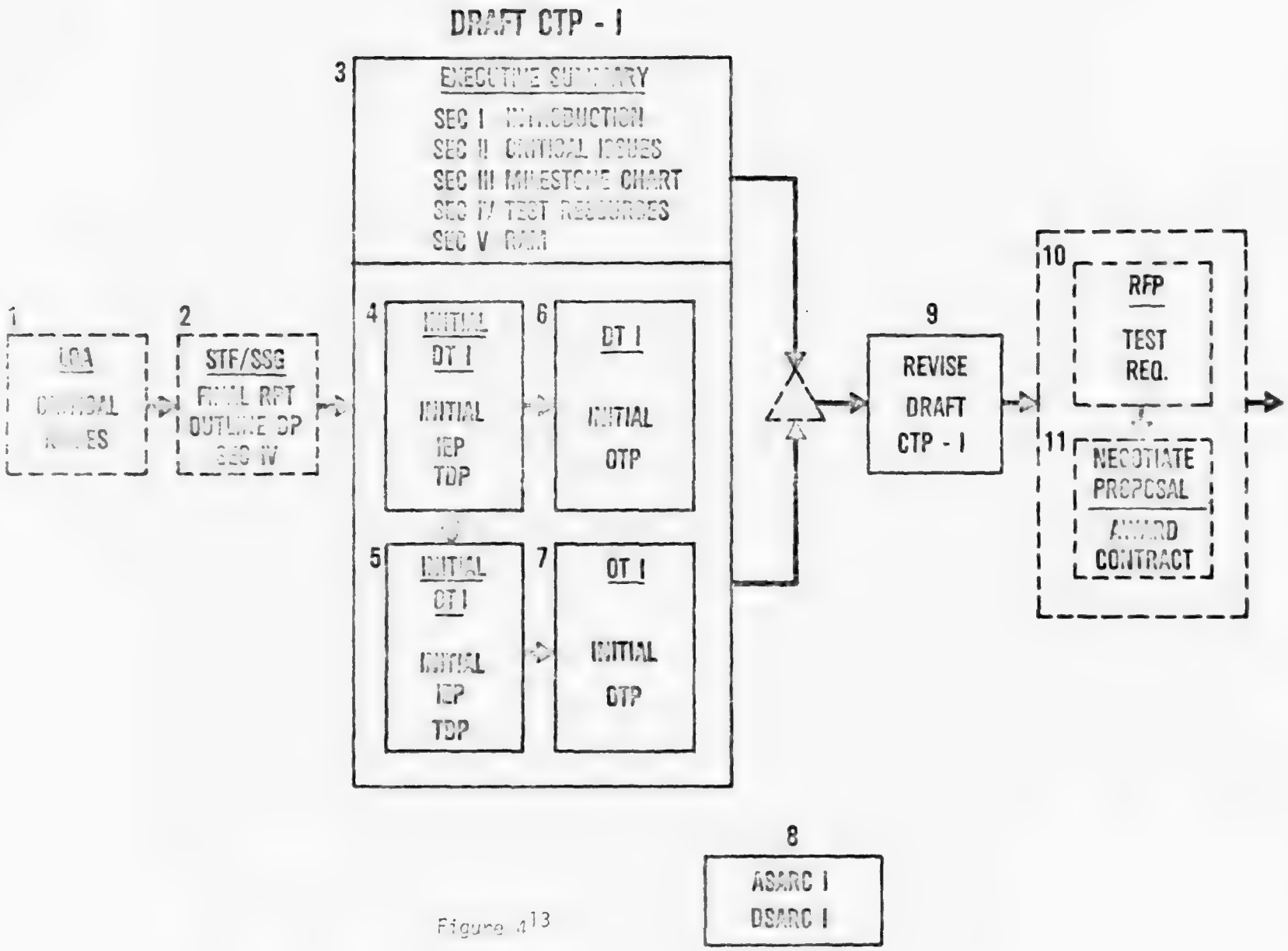
All coordination and integration are accomplished by making maximum utilization of the TIWG. Figures 4-9[13] show a more detailed breakdown of the process. All figures are greatly simplified and are intended to indicate a general process which occurs for each phase of the acquisition cycle. Complete information on the CTP and TIWG are too extensive to include in this study paper. Details are contained in DA Pamphlet 70-21, The coordinated Test Program.

3.5 New Test Definitions:

The SIDTC concept introduced new test terminology into the test community. Initially SIDTC terminology did not receive wide acceptance and usage in day-to-day activities. Many involved in testing preferred to continue using terms associated with the previous test concept such as: RDAT, ET, ST, and IPT. Figure 10[4] illustrates the relationship of new test terms to the time phased acquisition cycle and decision points. The list which follows defines major tests normally conducted during DT I, DT II, or DT III of a development effort.

EXPLANATION OF TERMS

Advanced Development Verification Test-Contractor (ADVTC-C). A test conducted by a contractor during the Validation Phase on components, subsystems and/or systems to demonstrate that contract materiel requirements have essentially been met and provide a significant degree of confidence that the materiel will successfully undergo and complete essential subsequent [illegible] testing. For non-[illegible] systems this test may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OTP
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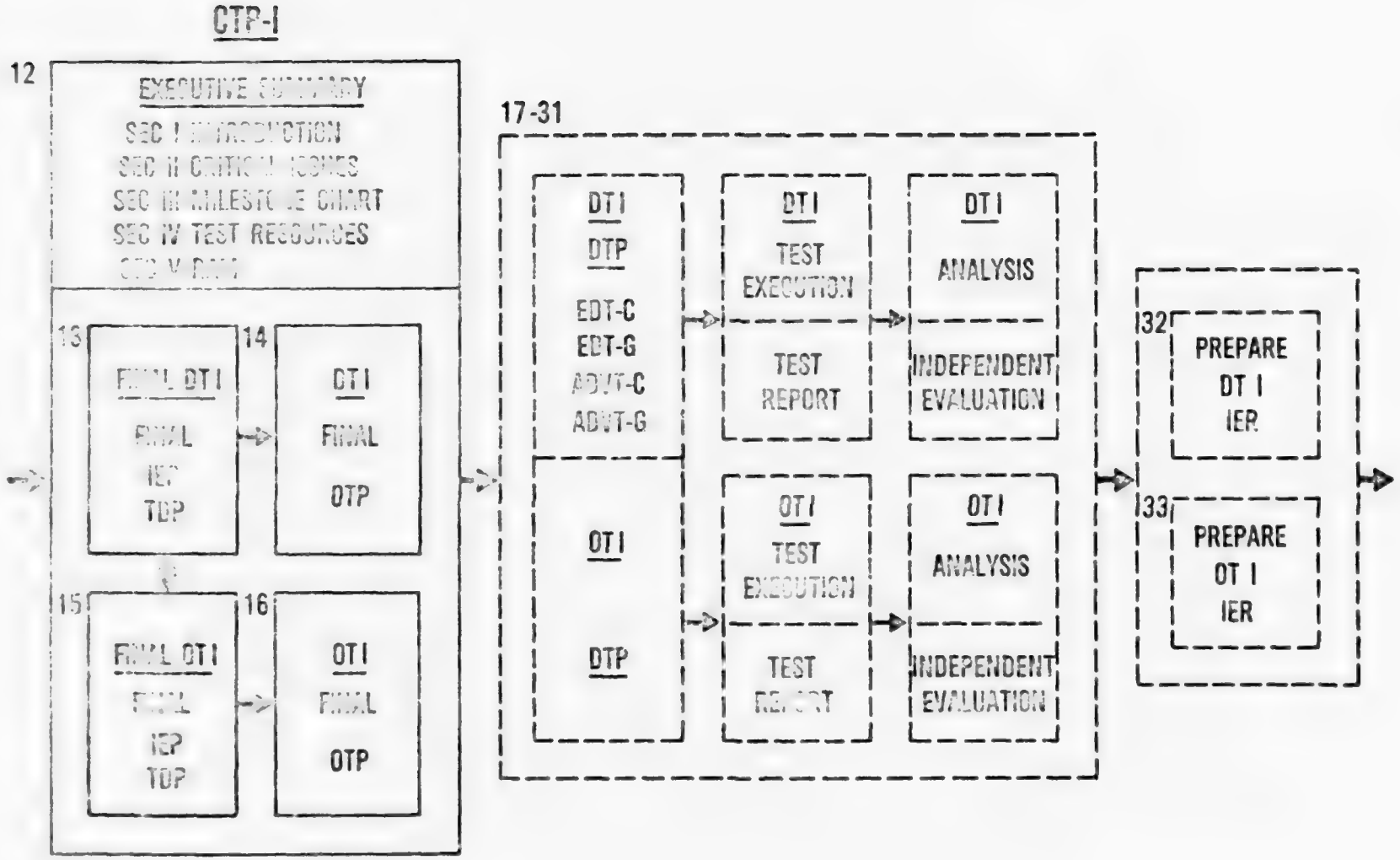
Figure 4[13]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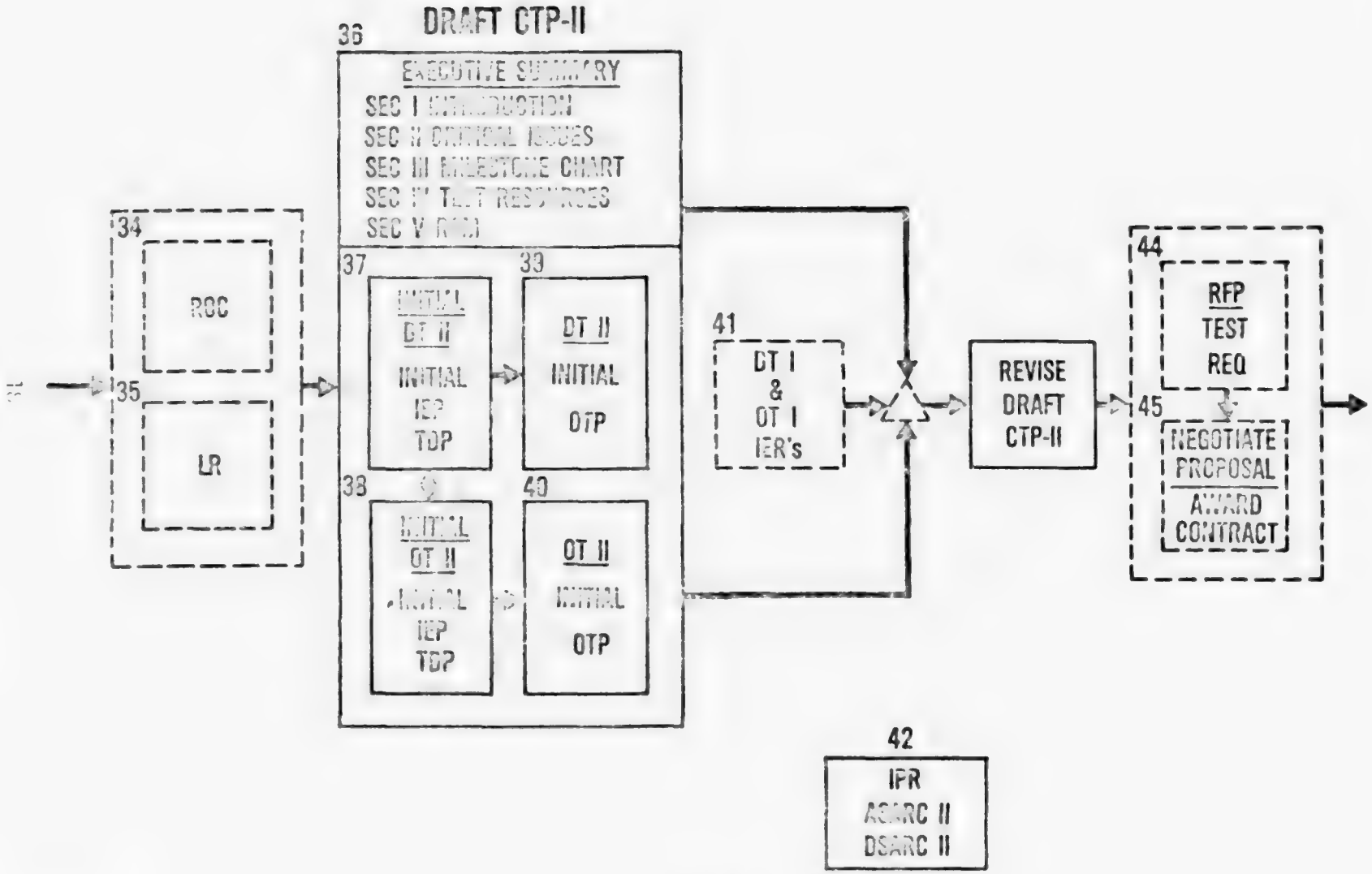
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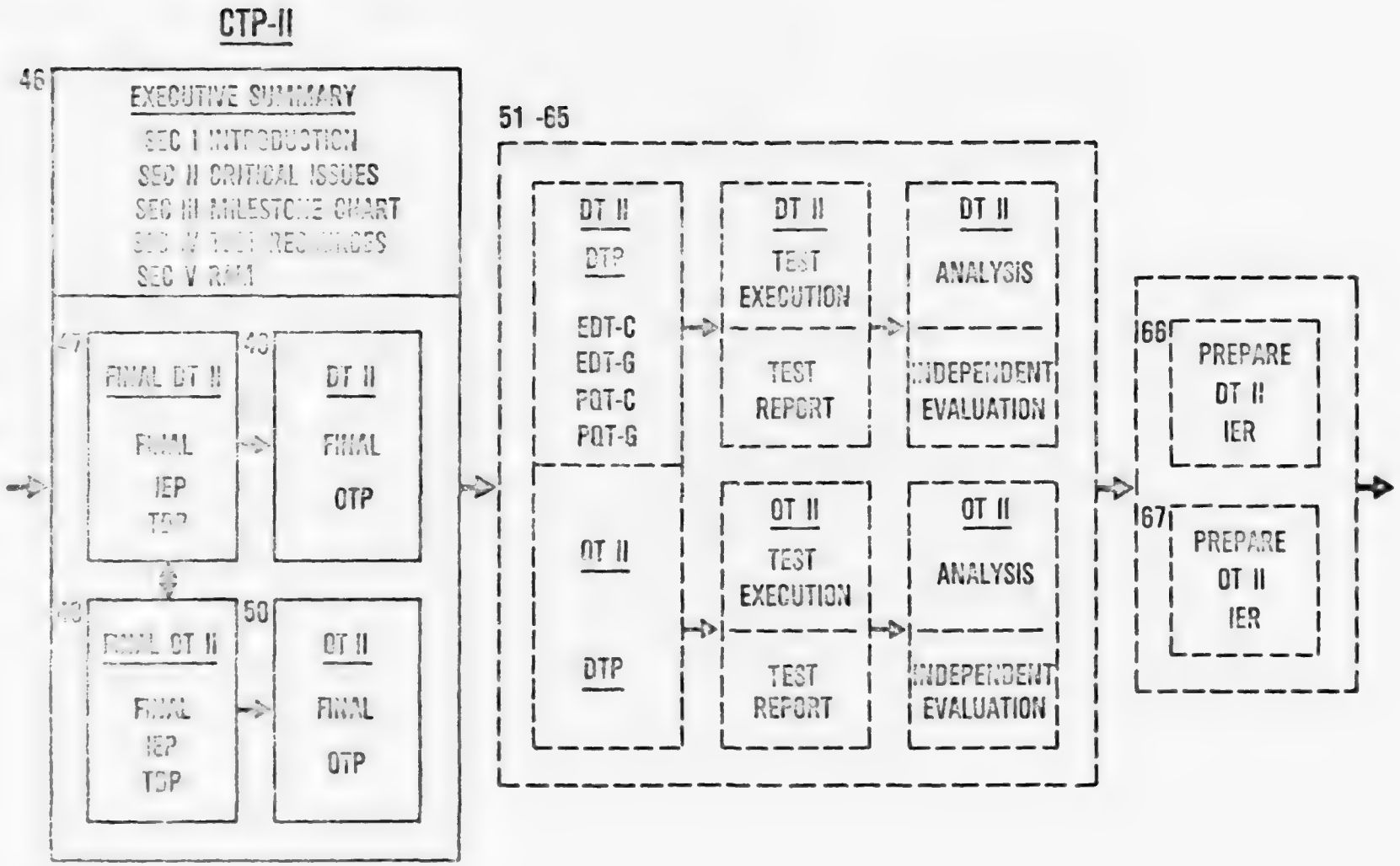
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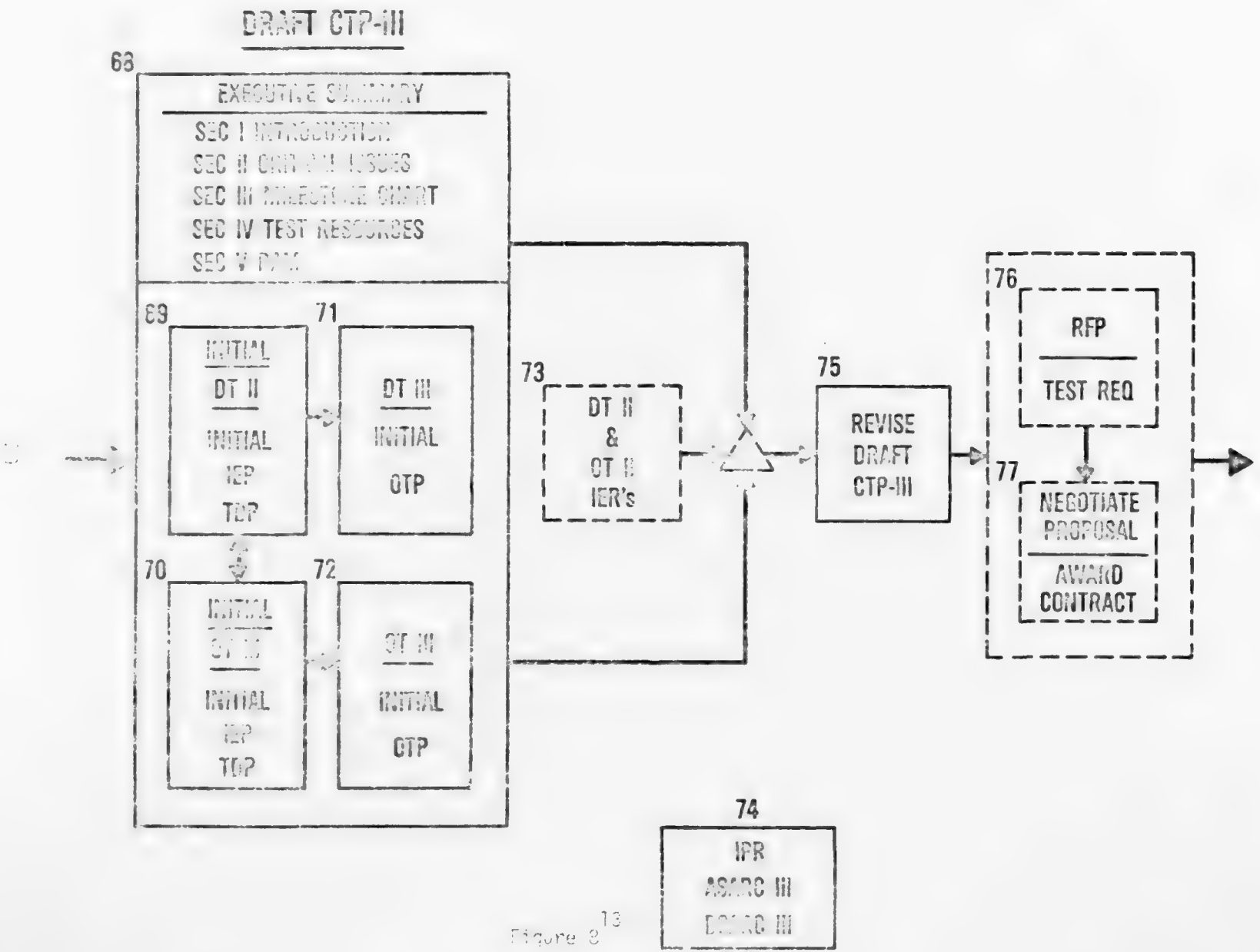
Figure 7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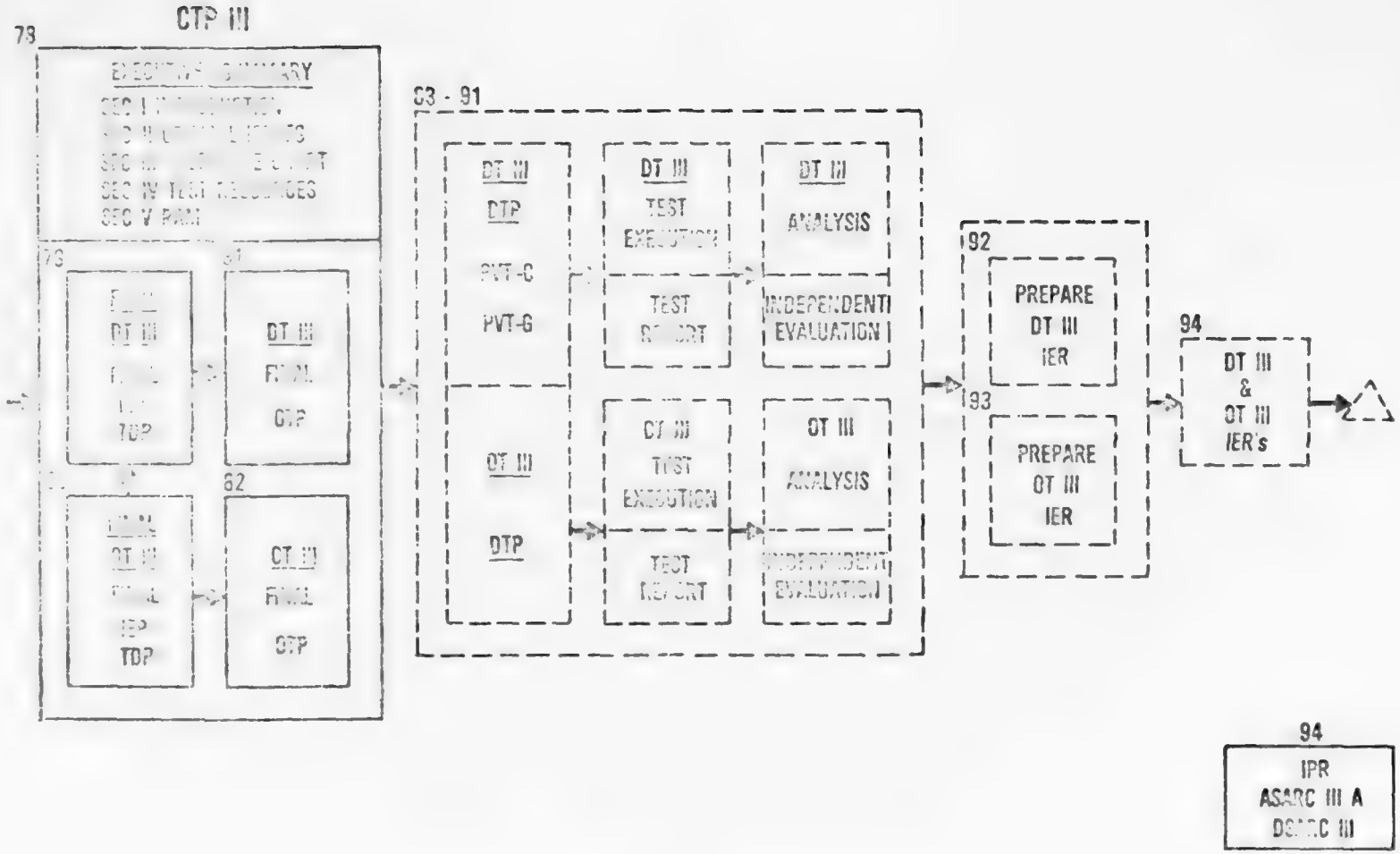
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ANALYSIS
INDEPENDENT
EVALUATION
DT III
DTP
DT III
TEST
EXECUTION
TEST
REPORT
DT III
ANALYSIS
INDEPENDENT
EVALUATION
92
PREPARE
DT III
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DT III
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OT III
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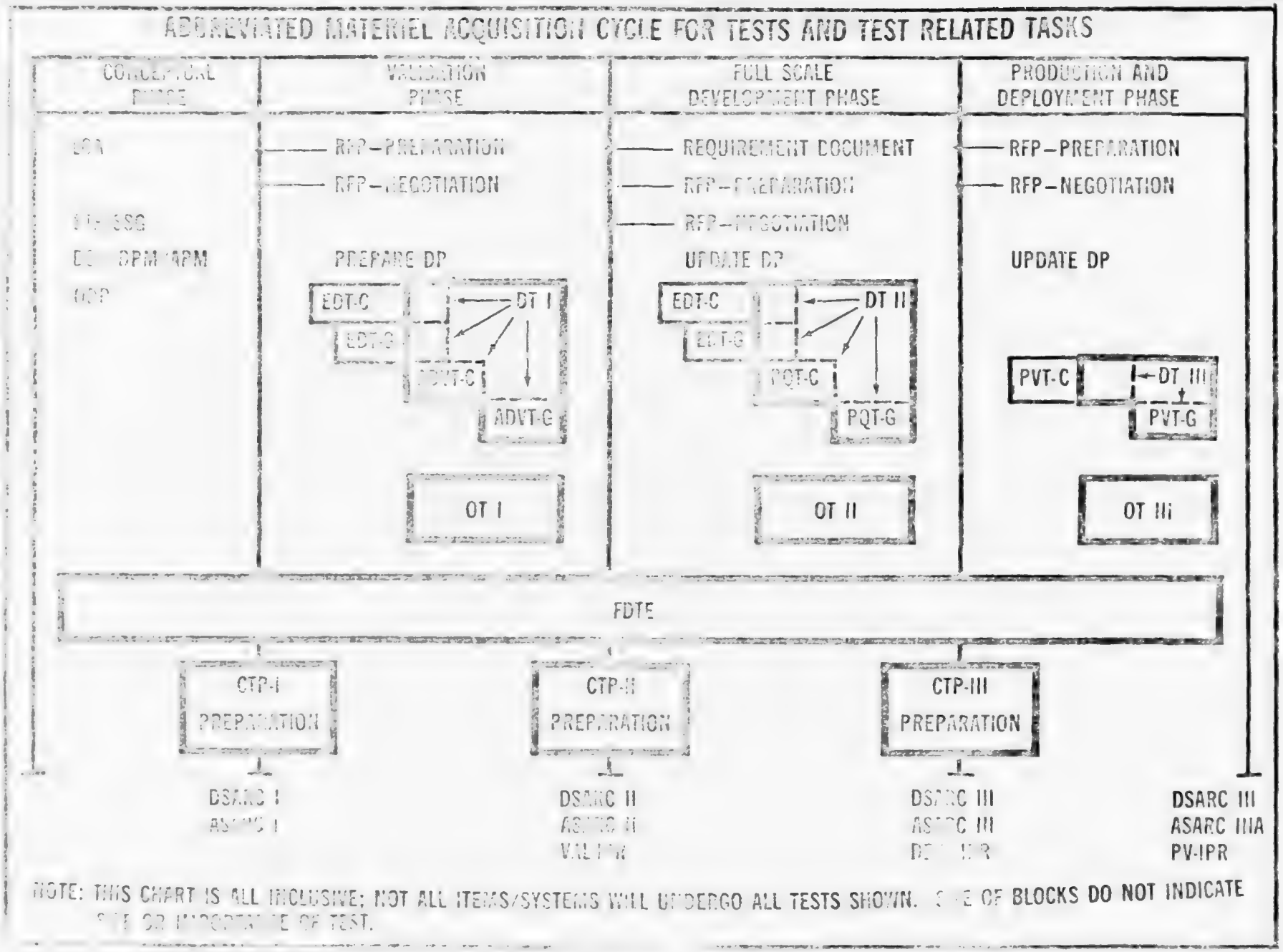
IPR
ASARC III A
DSARC III

Figure 3-13



NOTE: THIS CHART IS ALL INCLUSIVE; NOT ALL ITEMS/SYSTEMS WILL UNDERGO ALL TESTS SHOWN. SIZE OF BLOCKS DO NOT INDICATE SIZE OR IMPORTANCE OF TEST.

FIGURE 1-7

constitute the total verification testing required.

Advanced Development Verification Test-Government (ADVT-G). A test conducted by TECOM during the Validation Phase, only when essential, to independently validate contractor test results and execute those tests beyond the capabilities of the contractor. This test is the final verification test prior to the decision to enter the Full-Scale Development Phase.

Engineering Design Test-Contractor (EDT-C). A test conducted by a contractor during the Validation or Full-Scale Development phase to determine achievability of critical system technical characteristics, provide data for refining and ruggedizing hardware configurations, elminiate technical design risks or determine manageability of risks, and provide for evolution and verification of design changes.

Engineering Design Test-Government (EDT-G). A test conducted by a developer during the Validation or Full-Scale Development Phase to determine achievability of critical system technical characteristics, provide data for refining and ruggedizing hardware configurations, eliminate technical design risks or determine manageability of risks, and provide for evolution and verification of design changes.

Prototype Qualification Test-Contractor (PQT-C). A test conducted by a contractor during the Full-Scale Development Phase on components, subsystems and/or systems to demonstrate that contract material requirements have essentially been met and provide a significant degree of confidence

that the materiel will successfully undergo and complete essential subsequent government testing. This test incorporates the purpose of the former Research, Development and Acceptance Test (RDAT).

Prototype Qualification Test-Government (PQT-G). A test conducted by TECOM during the Full-Scale Development Phase, only when essential, to independently validate contractor test results and execute those tests beyond the capabilities of the contractor. This test is the final qualification test prior to a production decision.

Production Validation Test-Contractor (PVT-C). A test conducted by a contractor during initial production to demonstrate that contract materiel requirements have been met, prior to subsequent government testing.

Production Validation Test-Government (PVT-G). A test conducted by TECOM during initial production to independently validate contractor test results (only when essential) and execute those tests beyond the capabilities of the contractor. This test is the final validation test prior to production and deployment.[16]

3.6 Key Elements of an Operative SIDTC:

Five key areas have been cited as major elements for the successful functioning of the SIDTC:

- Coordination of effort
- Utilization of contractor test data
- Reduction and integration of tests
- Increased early soldier participation
- Emphasized independence of evaluation vs testing

1. Coordination of Effort:

More than ever before the materiel developer (PM) is the focal point for program management responsibility. Although the developer, contractor, development and operational testers, development and operational evaluators, trainer, and logistician are all intimately involved in the coordination process, recognition of PM leadership is very important to the success of SIDTC efforts. The materiel developer must coordinate the efforts of all participants and integrate valid requirements into cost effective development. The primary vehicle utilized for coordination is the TIWG. TIWGs should be composed of cooperative individuals with the authority to make concessions with respect to the parochial interests of the participants. As was pointed out earlier, an important effort of the project manager and TIWG is to develop and maintain the CTP to insure that maximum integration has been effected and that the test design is appropriate and cost effective.[11]

2. Utilization of Contractor Test Data:

Maximum utilization of validated contractor test data is another major element in the SIDTC concept. In the past, Army testers made little use of contractor test data, they were more intent on generating their own resources independent from the contractor. Now, extensive monitoring of contractor testing and utilization of validated contractor test results to satisfy Government test requirements are essentials of effective SIDTC. Government test vs contractor test requirements must be included in the RFP, LOI and clearly delineated in the contract. The contractor's share

of development testing has increased and test resources available for contractor use has also increased. Contractors should be encouraged to utilize Government test facilities at the proving grounds and ranges on a reimbursement for direct cost basis. When feasible, contractors can conduct contractor tests at Government test sites with contractor personnel or Government personnel can perform the tests strictly on a customer basis.[11]

3. Reduction and Integration of Tests:

Reduced test schedules and duplication of the development effort are basic objectives of SIDTC. Integration of Government and contractor testing is the primary means of accomplishing the reduction. Other means may also be considered. Production decision points may be achieved earlier by integrating test phases. For example, overlap between OT I and DT II or between DT III and OT III may be viable possibilities. It may also be possible to reduce the scope of DT/OT I and III. Combined DT/OT I and DT/OT III could also be accomplished in some cases.[11]

4. Early Soldier Participation:

Early user or troop participation is another major element in SIDTC. Solutions to user equipment problems, if surfaced early in the development cycle insures compatibility of critical man-machine relationships and acceptability of design strategy. This action alone can result in elimination of costly and time consuming design changes which can practically stymie a development program if they are surfaced downstream.[11]

5. Independence of Evaluation and Test:

The new emphasis on independent evaluation and independent test leads to more efficient test design and program structures. Increased technical planning requires more intensive early management and early commitment of increased resources. All of this should have a positive result on the overall development program and contribute to credibility of the SIDTC process.[11]

3.7 Program Successes with SIDTC:

At the time of writing of this report (October 1976) the SIDTC policy has been in effect approximately twenty-one months based on the Implementation Letter of 21 Januay 1975, as the reference point. Quantified data as to success or failure of the SIDTC relative to specific programs utilizing it was difficult to obtain by the writer in the limited time permitted to research this report. The indication is that little quantified data has been correlated and published at this time. However, there is evidence in some programs of positive results which can be attributed to utilization of SIDTC or elements of the new concept. Notable examples of SIDTC benefits to five major programs have been reported.

1. AAH-HELLFIRE/ASH:

This program involved DA effort to reduce the number of HELLFIRE Anti-Tank Missiles in a test program associated with the development of the Advanced Attack Helicopters. A special task force reviewed the programs and devised an integrated, coordinated test plan for all of the systems.

Through concurrency of test phases, earlier operational testing, and testing the HELLFIRE on a proven airframe, a shorter test cycle resulted from earlier production decisions. The result was a reduction of 90 HELLFIRE missiles, a total savings to all programs of $138 million, and earlier initial operational capabilities of approximately one year. Drawbacks identified were additional early-on costs and increased management risks due to the complexity of the integration of the systems.[11]

2. XM1:

The XM1 tank, designed to provide a significant improvement in ground combat power has integrated contractor and Government testing and utilized contractor data to reduce the scope of Government validation testing. Up to twenty-six percent of contractor firing data was utilized to satisfy a portion of Government testing.[11] Other contractor data were used, however, quantified benefits from this data were not reported.

3. UTTAS:

The Utility Tactical Transport Aircraft System is another program in which SIDTC concepts were applied. It is reported that this program has been reduced to an absolute minimum in length.[11]

4. MICV:

The Mechanical Infantry Combat Vehicle while undergoing contractor tests at Government test sites (Aberdeen and Yuma Proving Grounds) utilized soldiers to test, maintain, and evaluate the vehicle.[11] This program furnishes examples of two elements in the SIDTC process: (a) contractor testing at Government test facilities, and (b) soldier input and participation early in the life cycle.

5. SAM-D (PATRIOT):

In this program the coordinated efforts of the major participants resulted in development of a firing matrix to satisfy both industry and Government test data requirements. The approach was expected to save dollars and through improved test design permit a better evaluation to be available early in the program to support key production decisions.[11]

3.8 Other Observations:

1. Developer - PM Related

Initially it was believed that an adversary realationship would develop between the evaluator and developer - PM as a result of SIDTC emphasis on independent evaluation of validated test data as opposed to independent testing which in the past was suspected of being too close to the developer. Some PM's appeared to feel that addition of the independent evaluator would cause unnecessary cost increases and delays in their programs. This apprehension seems to have been largely dispelled as front-end loading of programs has tended to reduce surprises, reduce program bias in decision making, and help to increase credibility of test results.[18] All of these are positive benefits to the PM.

2. TECOM Related:

a. There is evidence of reduction in duplication of testing by Government testers. However, increases in successful Government testing

after contractor tests have been performed cannot be conclusively stated at this time. It is believed that these results will become more evident in another year or two.

b. Increased monitoring by TECOM representatives at contractor facilities have in some cases caused stresses in manning. Insufficient personnel to accommodate the increased and extended TDY duties on a timely basis could cause perturbations in monitor activities or manning of test programs being conducted simultaneously at the proving grounds. Where contractor tests are used to satisfy TECOM testing contractor test plans could be improved to include sifficient detail to obviate TECOM rewriting of the plans to meet Government test standards and regulations.[15] These rewrites consume additional manpower and time. Lack of coordination of contractor test plans was pointed to as a lingering problem.

c. Environmental testing by the contractor has in some instances been an issue. Instances were cited in which contractor environmental chambers were inadequate or outmoded. In these cases doubts as to the contractors compliance with Military Standard and Government test regulations were very real, raising serious questions as to the validity of the test data. In some cases the contractor has been reluctant to take equipment to TECOM facilities for conduct of these tests. In general, there seems to be a reluctance on the part of the contractors to utilize TECOM test facilities for conducting contractor tests. However, requests for use of TECOM test facilities are reported to be increasing.[15]

d. Minor difficulties have been experienced in getting TECOM tests delineated in the RFP. This is hardly a problem where major systems are concerned, but is more evident with smaller, non-major systems. The difficulty, where experienced, apparently stemmed from the developer's failure to involve TECOM early enough in the program. Effort in the form of additional guidance from DARCOM has been made to improve this situation.[6]

e. It was hypothesized that increased costs associated with TIWG attendance and extended TDY required for close monitoring of tests at the contractor's plant would negate possible dollar savings from combining test requirements. At this point evidence indicates that savings due to integration of tests are not off-set by increased TIWG and TDY costs. Initial test cost considerations are made when the Independent Evaluation Plan (IEP), and CTP are developed and ample opportunity exists to make comparisons and determine which course is most feasible and economical.[17]

f. A more serious problem associated with the new test concept is the potential for proliferation of developmental testing outside of TECOM. The danger exists that PMs and commanders will tend to utilize materiel developer's test facilities in lieu of TECOM test sites. A notable example of this type of problem was the PM-FAMECE proposal to conduct the Government portion of DT II (PQT-G), i.e., Prototype Qualification Test-Government, at the MERADCOM location rather than at a TECOM facility.[8]

Although the PM-FAMECE decision was upheld[9] as being more feasible in this case, the problem was considered serious enough to prompt a caution from DARCOM against potential proliferation.[7,9,10]

3. Evaluator Related:

a. Questions raised at the out-set of implementation as to AMSAA's credibility as a qualified independent evaluator[19] for some programs have in most instances been dispelled and credibility is increasing as AMSAA becomes more attuned to pragmatical aspects of the developer's testing needs.[18]

b. AMSAA now presents an independent evaluation to the developer and Commanding General, DARCOM. Each program is treated on a case by case basis. Headquarters, DARCOM determines if the independent evaluation will be folded into the DA IPR/ASARC/DSARC or presented separately.

c. Stresses due to increased manpower requirements appear to be a significant factor for evaluators for both major and non-major evaluations. The number of programs initially to be phased-in by AMSAA for evaluation was subsequently revised downward and some of the programs were assigned to TECOM-MSC/Red team for evaluation. Another indication of the increased manning requirement may be derived from the ARMCOM report on scope and manpower requirements of the ARMCOM System Analysis Directorate in support

of the Test Design and Evaluation effort as part of the SIDTC policy in evaluation of development testing of systems not evaluated by AMSAA. ARMCOM Systems Analysis reported the need for 25 additional full professional personnel to fulfill mission responsibilities resulting from SIDTC.[3]

4. Contractor Related:

a. Use of DD Form 250 to remove equipment from the contractor's plant for test only prior to formal acceptance by the Government has not been a problem with the contractor. It is recognized that the purpose of the DD 250 in this respect is to show who has responsibility for safeguarding and possession of the equipment. In such cases the Government is the liable party.[17]

b. Contractor participation in test planning and use of Government facilities for contractor tests has, in general, not been a problem. These arrangements are determined at the time of RFP preparation. The contractor must then be aware of each test, where it will be performed, the associated costs, and who is going to pay whom for what. Actually, this type of contractor involvement has proven to be an assist in terms of definitiveness of testing arrangements.

SECTION IV

SUMMARY

4.1 Implementation:

In the opinion of a DARCOM SIDTC authority, the SIDTC policy is certainly fully implemented at this time. It was estimated that the policy could have been considered fully implemented by January 1976.[18] DA components and activities appeared to react well to the implementation instructions. Implementation by new programs was easier and faster than for those programs which were on-going. On-going programs which were in various stages of development caused some delay in full implementation. However, these delays were anticipated.

4.2 Impact of SIDTC:

1. The SIDTC concept appears to have been highly beneficial to new programs which have utilized it from inception or from early stages of the development. For on-going programs benefits have been less evident, possibly because the advantages that accrue to intensive early-on management could not be realized or problems resulting from lack of it had already started. The policy has had the desired effect of reducing duplicatory testing, but the problem of proliferation of materiel developer testing outside of TECOM has surfaced and could cause future problems.

2. A major benefit resulting from SIDTC has been the improved communications throughout the test community especially in terms of communication with the operational test proponents. Although integration of operational testing was not formally included in initial implementation plans, the policy was used as a jumping-off point to expand interaction with operational testers and OTEA.[18] This expanded interface is evidenced by the increased operational participation and coordination in all test planning particularly as it applies to TIWG activities and development of the CTP.

3. There is not sufficient quantified data available as yet to fully evaluate the SIDTC, particularly in terms of dollar savings. Such an evaluation will become feasible as additional new programs fully utilize the new concept and as more information becomes available from programs currently utilizing it as these programs move downstream in the development cycle. Although quantified data is insufficient to reach definite conclusions to date, the potential for savings in cost and time are evident. Limited information to this effect has been reported. Dollar savings and reductions in the acquisition life cycle are expected to become more evident as participants become more accustomed to SIDTC practices.

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